中显液晶
技术资料

型号 ZX12864I

2009年3月15日

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RECORDS OF REVISION

DATE	REVISED NO.	REVISED DESCRIPTIONS	PREPARED	CHECKED	APPROVED
NOV,23.2005	1.00	FIRST ISSUE	HCC	Lwj	
September 28, 2007	1.01	Amend wrappage and address		ynn	
December 8, 2007	1.02	Amend pin assignment		ynn	

CONTENTS

December 8, 2007
Version1.02

1. GENERAL SPECIFICATIONS：

1-1 SCOPE:

This specification covers the delivery requirements for the liquid crystal display delivered by YAOYU TECHNOLOGY to Customer。

1-2 PRODUCTS:

Liquid Crystal Display Module (LCM)

1-3 MODULE NAME:

YMSC –G12864IDYEWWD

2. FEATURES：

2-1 MAIN LCD (LARGE)

Item	Standard Value
Display Type	128 *64 dots
LCD Type	□FSTN, BLUE,Transmissive,Negative,Extened TEMP □FSTN, Transflective,Positive,Extened TEMP □STN, BLUE,Transmissive,Negative,Extened TEMP □STN, GREY,Transflective,Positive,Extened TEMP ■STN, Yellow-GREEN,Positive,Extended TEMP
Drive Pattern	1/64 Duty, 1/9Bias
Viewing Direction	6 O'clock
Backlight Type	□YELLOW-GREEN LED BOTTOM BL ■WHITE EL BL □CCFL WHITE BL
Weight	TBD
Interface	8-bit MPU interface
Driver IC	KS0108

3. MACHANICAL SPECIFICATIONS：

ITEM	STANDARD VALUE	UNIT
DISPLAY FORMAT	128X 64 DOTS	
MODULE DIMENSION	54.0(W) X 50.0(H) X 9.5(T)MAX	mm
EFFECTTVE DISPLAY AREA	43.5(W) X9.0(H)	mm
DOT SIZE	0.28(W) X 0.35 (H)	mm
DOT PITCH	0.32W) X 0.39 (H)	mm
LCD TYPE	YELLOW-GREEN, STN	
DUTY AND BIAS	1/64 DUTY; 1/9 BIAS	
VIEWING DIRECTION	6:00	
BACK LIGHT	White EL	

4. ABSOLUTE MAXIMUM RATING

ITEM	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			MIN	TYP	MAX	
POWER SUPPLY FOR LOGIC	VDD	Ta=25℃	-0.3	—	7.0	V
INPUT VOLTAGE	VIN	Ta=25℃	-0.3	—	VDD+0.3	V
Module OPERATION TEMPERATURE	TOPR	---	-20	—	+70	℃
Module STORAGE TEMPERATURE	TSTG	---	- 30	—	+80	℃
Storage Humidity	H_D	Ta < 40 °C	-		90	%RH

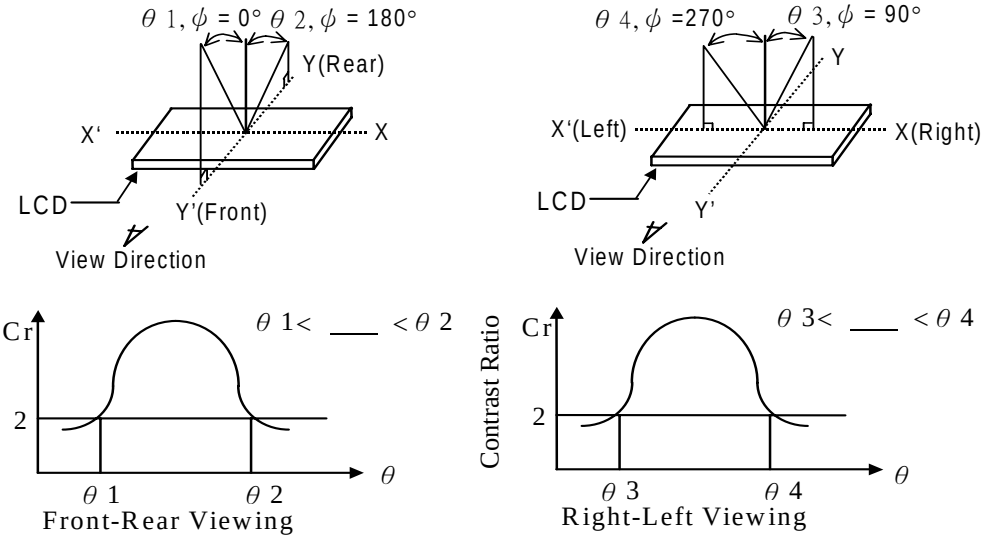
5. ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
Supply Voltage (logic)	Vdd-Vss	-	4.8	5	5.2	V
Supply Voltage (LCD)	Vlcd	Vdd=5V (25°C)	9.6	9.8	10.2	V
Input signal voltage	V-ih	“H” level	0.7Vdd	-	Vdd	V
	V-il	“L” level	0	-	0.8	V
Output signal voltage	V-oh	“H” level	2.4	-	-	V
	V-ol	“L” level	-	0.4	-	V
Supply Current (logic)	Icc	-	-	1.2	5	mA
Supply Current (LCD)	Io	-	-	-	-	mA
Supply Voltage (LED)	V-bl	See note 1	4.9	5.0	5.1	V
Supply Current (LED)	I-bl	See note 1	-	60		mA

Note 1: On the PCB we have had DC-AC convertor.

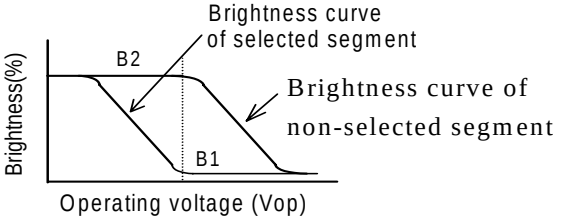
6.OPTICAL CHARACTERISTICS

(1) DEFINITION OF VIEWING ANGLE

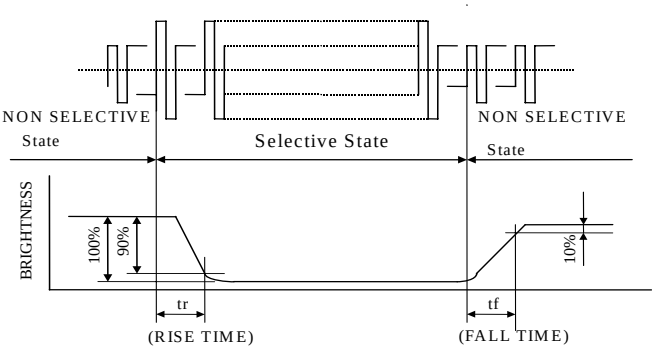


(2) DEFINITION OF CONTRAST

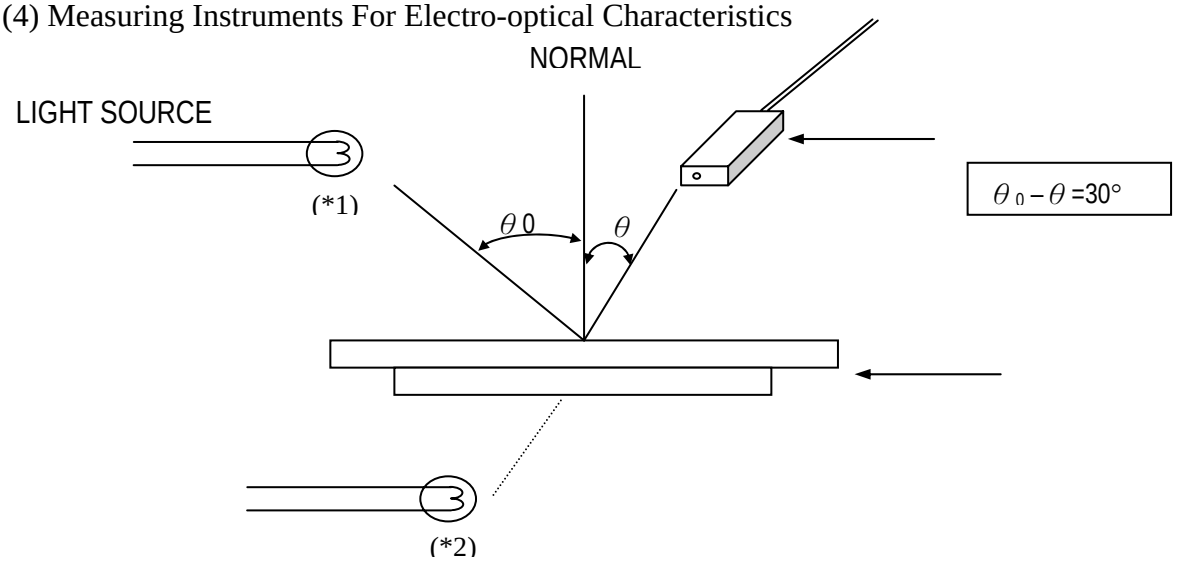
$$C.R = \frac{\text{Brightness of non-selected segment (B2)}}{\text{Brightness of selected segment (B1)}}$$



(3) DEFINITION OF RESPONSE



(4) Measuring Instruments For Electro-optical Characteristics



7.0 .TIMING CHARACTERISTICS

AC Characteristics (V_{DD}=+5V ±10%, V_{SS}=0V, T_a=-30°C~+85°C)

1. Clock Timing

Characteristic	Symbol	Min	Typ	Max	Unit
CLK1, CLK2 Cycle Time	t_{CY}	2.5	-	20	μs
CLK1 'LOW' Level Width	t_{WL1}	625	-	-	ns
CLK2 'LOW' Level Width	t_{WL2}	625	-	-	
CLK1 'HIGH' Level Width	t_{WH1}	1875	-	-	
CLK2 'HIGH' Level Width	t_{WH2}	1875	-	-	
CLK1-CLK2 Phase Difference	t_{D12}	625	-	-	
CLK2-CLK1 Phase Difference	t_{D21}	625	-	-	
CLK1, CLK2 Rise Time	t_R	-	-	150	
CLK1, CLK2 Fall Time	t_F	-	-	150	

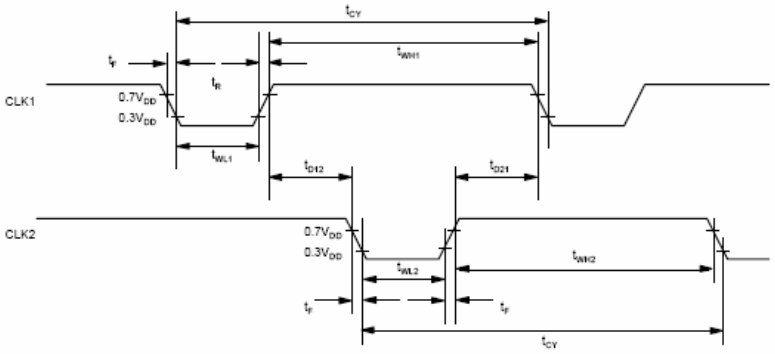


Fig4. External clock waveform

2. Display Control Timing

Characteristic	Symbol	Min	Typ	Max	Unit
FRM Delay Time	t_{DF}	-2	-	+2	us
M Delay Time	t_{DM}	-2	-	+2	us
CL 'LOW' Level Width	t_{WL}	35	-	-	us
CL 'HIGH' Level Width	t_{WH}	35	-	-	us

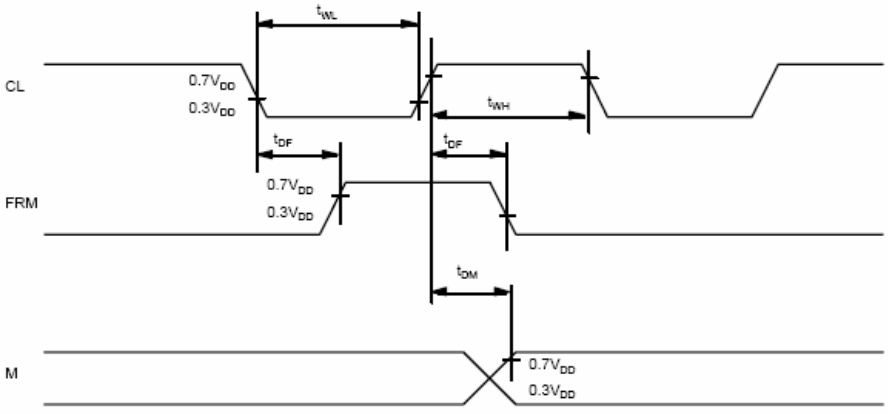


Fig 5. Display control signal waveform

3. MPU Interface

Characteristic	Symbol	Min	Typ	Max	Unit
E Cycle	t_C	1000	-	-	ns
E High Level Width	t_{WH}	450	-	-	ns
E Low Level Width	t_{WL}	450	-	-	ns
E Rise Time	t_R	-	-	25	ns
E Fall Time	t_F	-	-	25	ns
Address Set-Up Time	t_{ASU}	140	-	-	ns
Address Hold Time	t_{AH}	10	-	-	ns
Data Set-Up Time	t_{DSU}	200	-	-	ns
Data Delay Time	t_D	-	-	320	ns
Data Hold Time (Write)	t_{DHW}	10	-	-	ns
Data Hold Time (Read)	t_{DHR}	20	-	-	ns

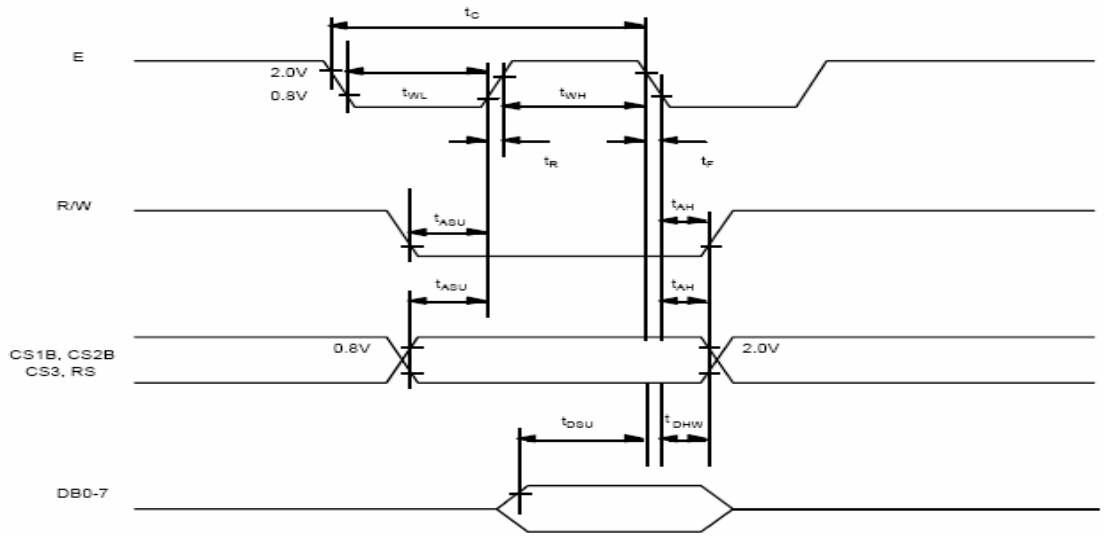


Fig 6. MPU write timing

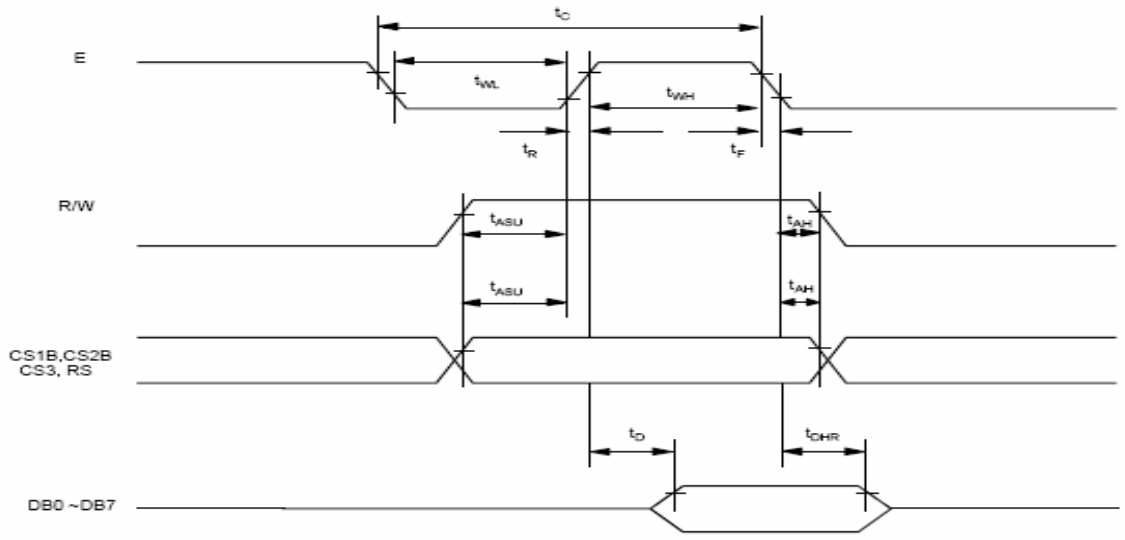
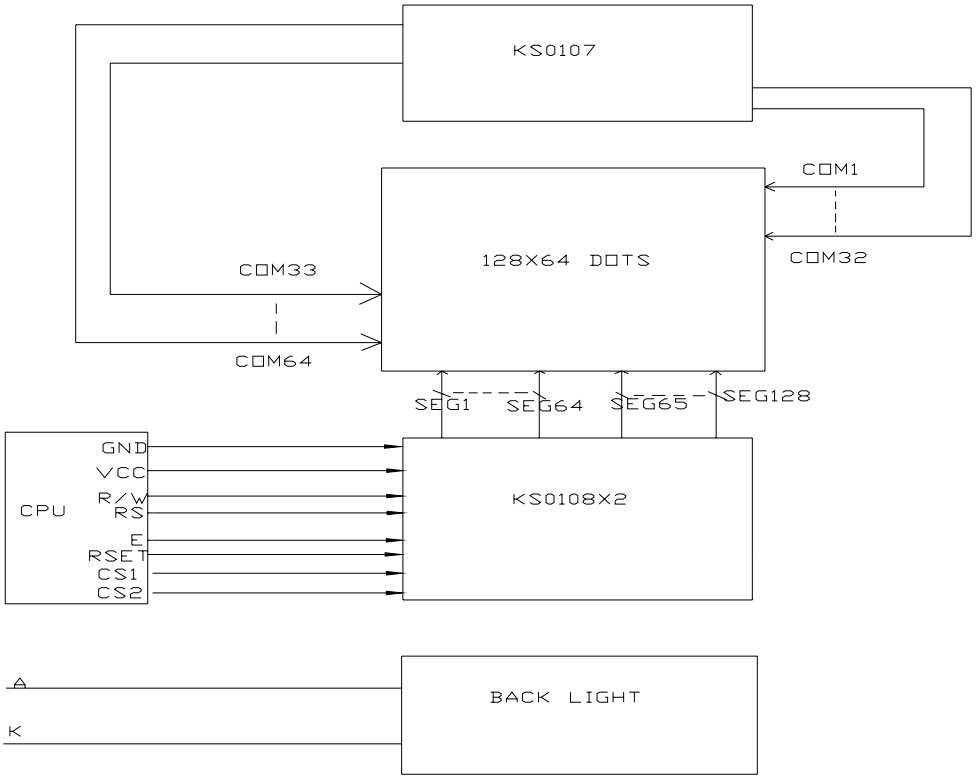


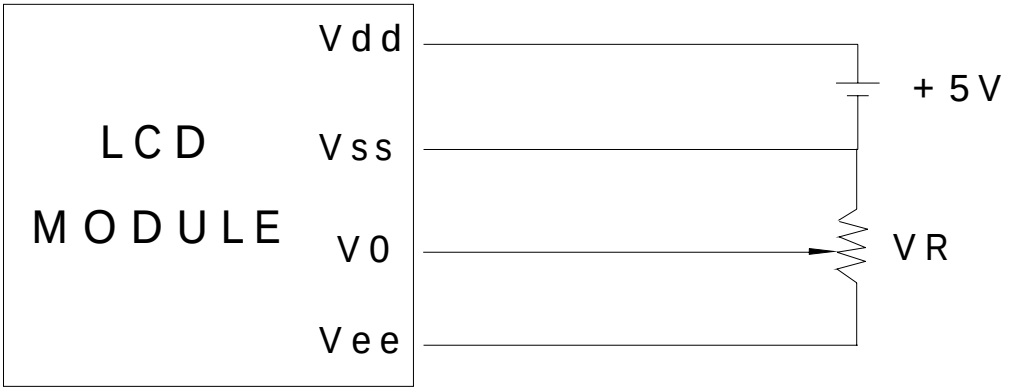
Fig 7. MPU Read timing

8. PIN ASSIGNMENT

PIN	SYMBOL	FUNCTION
1	VSS	Power Supply(GND)
2	VDD	Power Supply(+5V)
3	VO	Power Supply for LCD(Contrast Adjust)
4	RS	RS=“H”→ DB(0:7):Display RAM Data; RS=“L”→ DB(0:7):Instruction Data;
5	R/W	Read or Write R/W=“H”:read; R/W=“L”:Write
6	E	Enable signal.
7~14	DB0~DB7	Data Bus
15	CS1	Chip selection of IC1(ks0108) In order to interface data for input or output,the terminal has to be CS1=H.
16	CS2	Chip selection of IC2(ks0108) In order to interface data for input or output,the terminal has to be CS2=H.
17	RET	Reset signal
18	Vout	Negative Voltage Supply
19	CO_EL	Electroluminescent Lamp Enable.When driven HIGH,this input pin enables the EL driver output EL1 and EL2 to the EL lamp.
20	EL2	OPEN

9. BLOCK DIAGRAM



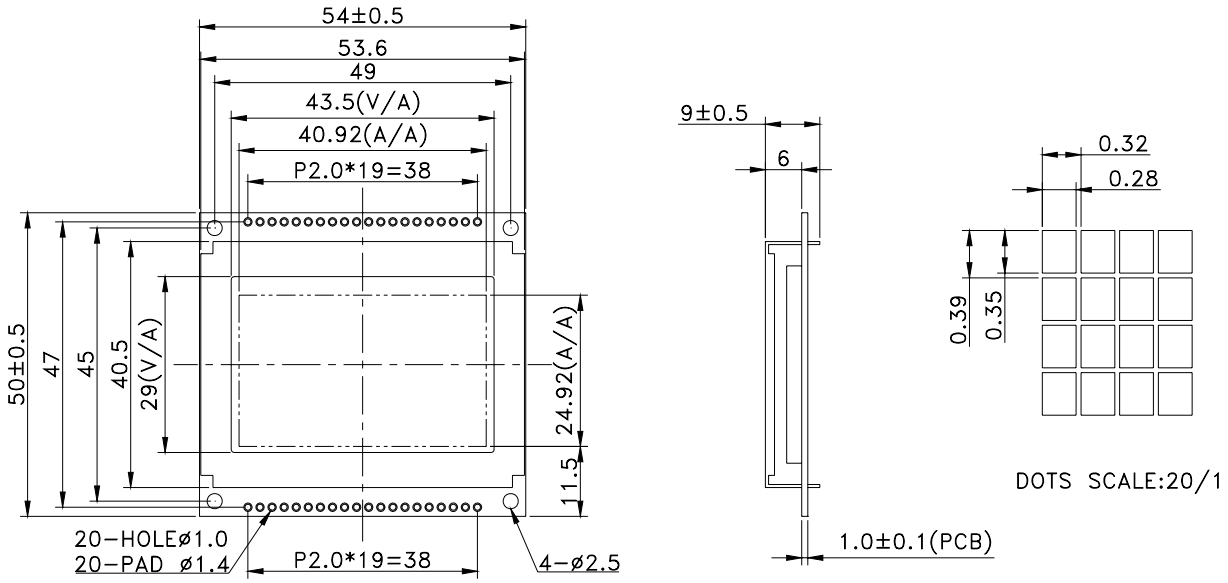


Vdd-V0: LCD Driving Voltage
VR: 10K - 20K

Display Control Instruction:

Please refer to the series of KS0108.

10.OUTLINE DIMENSIONS



11. ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	CONDITIONS	CRITERION
OPERATING TEMPERATURE	TOPR	-20℃～+70℃	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
STORAGE TEMPERATURE	TSTG	-30℃～+80℃	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
HUMIDITY	—	See Note	WITHOUT CONDENSATION

12.RELIABITY

ITEM	CONDITIONS	CRITERION
OPERATING TEMPERATURE	HIGH TEMPERTURE +70℃ 240HRS	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
	LOW TEMPERTURE -20℃ 240HRS	
STORAGE TEMPERATURE	HIGH TEMPERTURE +80℃ 240HRS	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
	LOW TEMPERTURE - 30℃ 240HRS	
HUMIDITY	40℃ 90%RH 240HRS	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
VIBRATION	• Operating Time: thirty minutes exposure for each direction (X,Y,Z) • Sweep Frequency: 10～55Hz (1 min) • Amplitude: 1.5mm	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
THERMAL SHOCK	-20℃(30mins) ←→+70℃(30mins) 10 cycles	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION

*NOTE: TEST CONDITION

(1)TEMPERATURE AND HUMIDITY: IF NO SPECIFICATION, TEMP. SET AT 25±2℃, HUMIDITY SET AT 60±5%RH

(2) OPERATING STATE: SAMPLES SUBJECT TO THE TESTS SHALL BE IN " OPERATING" CONDITION

13. Precaution for Use

The following precautions should be followed, since this module contains precise parts.

(1) Do not store module for an extended periods of time under the conditions of high temperature and high humidity.

(2) Avoid using or storing the module in areas that expose it to direct sunlight or ultraviolet rays.

(3) Use protective finger covers when handling the module to avoid scratching or staining the module.

(4) Care should be taken not to expose the module to static electricity, because the module contains C-MOS LSI's.

(5) The LSI is sensitive to light.
The user's product should be designed so that LSI is not exposed to any light during operation.

(6) During installation, cover the display area with acrylic protection plates to protect the polarizer plate and LCD cells.

(7) Do not apply any excessive shocks to the module because the module contains sensitive LCD cells. Do not use a module, which has experienced strong mechanical shock.

(8) Care should be taken when the power supply turns on as following.
(a) Do not apply any input signals before the supplying voltage is applied.
(b)Do not turn off the power supply while any input signals are applied.

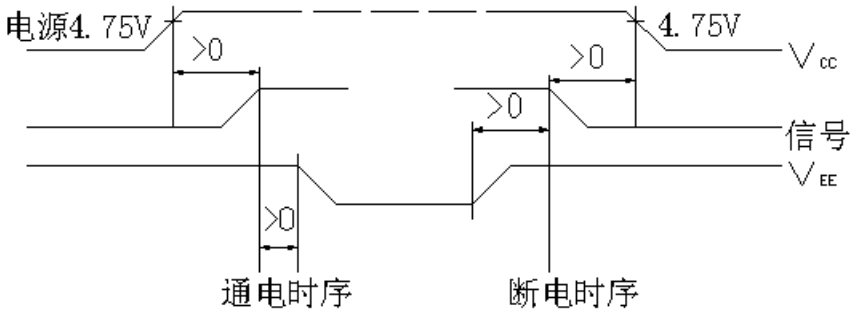
Caution

(1) Dangerous. Do not shock glass because glass can break.
(2) If module breaks, do not touch it directly.
(Glass could stick or cut skin.)
(3) Do not swallow Liquid Crystal.
(In case of broken LCD panel, do not swallow liquid crystal even if there is no proof that liquid crystal is poisonous.)
(4) If liquid crystal is exposed to skin, wash the area thoroughly with alcohol or soap.
(5) When disposing of the product, please observe industrial waste disposal laws in each country and district.
(6) In case of injury, give immediate treatment and consult with a doctor.
(7) This product is constructed precisely. Don't disassemble or modify.

※ Neglecting this mark can cause injury to humans and damage to materials

液晶显示模块使用注意事项

1. 请勿随意自行加工、整修、拆卸。
2. 避免对液晶屏表面施加压力。
3. 不要用手随意去摸外引线、电路板上的电路及金属框。
4. 如必须直接接触时，应使人体与模块保持同一电位，或将人体良好接地。
5. 焊接使用的烙铁、操作用的电动改锥等工具必须良好接地，没漏电。
6. 严防各种静电。
7. 模块使用接入电源及断开电源时，必须按图时序进行。即必须在正电源（ 5 ±0.25V）稳定接入后,才能输入信号电平。如在电源稳定接入前，或断开后就输入信号电平，将会损坏模块中的集成电路，使模块损坏。



8. 点阵模块在调节时，应调整 VEE 至最佳对比度、视角时为止。如果 VEE 调整过高,不仅会影响显示，还会缩短液晶的寿命。
9. 模块表面结雾时，不要通电工作，因为这将引起电极化学反应，产生断线。
10. 模块要存储在暗处（避阳光），温度在-10℃～+35℃，湿度在 RH60%以上的地方。如能装入聚乙烯口袋（最好有防静电涂层）并将口封住最好。

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